

INTERGENERIC GALLIFORM HYBRIDS: A REVIEW

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Henry Seebohm, in "The Birds of Siberia" (1901: 501-502), makes this cogent observation: "The subject of the interbreeding of nearly-allied birds in certain localities where their geographical ranges meet or overlap, and the almost identical subject of the existence of intermediate forms in the intervening district between the respective geographical ranges of nearly-allied birds, is one which has not yet received the attention which it deserves from ornithologists. The older brethren of the fraternity have always pooh-poo'h'd any attempt to explain some of these complicated facts of nature by the theory of interbreeding, and have looked upon the suggestion that hybridisation was anything but an abnormal circumstance as one of the lamest modes of getting out of an ornithological difficulty." The following summary will show that interbreeding of galliform genera has often been observed; indeed that two wholly different intergeneric hybrids, one of the Old World, one of the New, have been recovered so often that they can hardly be considered 'abnormal' except in a very limited sense.

The Old World hybrid referred to results from the crossing of the Blackcock (*Lyrurus*) and Capercaillie (*Tetrao*). DeWinton (1894: 448) said that "of all hybrids among birds in a wild state this one seems to be the most frequent." Authors seem to be in agreement that the hybrid results principally, if not always, from the interbreeding of male *Lyrurus* with female *Tetrao* in areas throughout which (a) extension of range is taking place, or (b) one or the other genus is rare, e.g., Scotland, where *Tetrao* has been introduced following extirpation (Millais, 1906: 55-56; DeWinton, 1894). Witherby *et al.* (1941: 210) summarize by saying: "In regular extensions of range females [*Tetrao*] habitually precede males, which, however, 'are seldom more than a season in following them' (Millais), and before appearance of males females are liable to pair with Blackcock, producing hybrids." Data as to the fertility of these hybrids are conspicuously lacking. *Lyrurus* and *Tetrao* are known to hybridize also with other genera—especially *Phasianus* and *Lagopus* (see below).

The New World hybrid referred to results from the crossing of the Prairie Chicken or Pinnated Grouse (*Tympanuchus*) and Sharp-tailed Grouse (*Pedioecetes*). William Brewster (1877: 66-68) described this hybrid, "provisionally" calling it *Cupidonia cupidini-columbiana*, following the nomenclatural practice of Robert Collett (1872. "Remarks on the Ornithology of Northern Norway." *Forhandl. Vidensk. Selsk.*, Christiania, p. 50). Since 1877 numerous articles have appeared regarding this hybrid, but so far as I know none of these gives any positive information as to the reproductive capacities of the F₁ generation. Recently observed intergradation between the two genera on Manitoulin Island, Lake Huron, indicates a high percentage of fertility among hybrids. Amadon (1950: 494) says of this area: "Manitoulin Island . . . was recently colonized by both Prairie Chickens . . . and Sharp-tailed Grouse. . . . The latter occur in much smaller numbers and, presumably as a result of their failure to find mates of their own species, a high percentage of the Manitoulin grouse thus far examined show evidence of hybridization."

Tympanuchus and *Pedioecetes* have been known to interbreed also with other genera. A *Tympanuchus* × *Phasianus* hybrid reported recently by Lincoln (1950: 212) was actually taken about 1933. A *Pedioecetes* × *Dendragapus* hybrid reported by Brooks (1907: 167) was taken at Osoyoos, British Columbia. The specimen is in the Provincial Museum at Victoria, Vancouver Island.

Many hybrids involving the Ring-necked Pheasant (*Phasianus colchicus*) have been reported, most of them from the Old World, a few from the New. Jourdain (1912) reported 60 *Phasianus* × *Lyrurus* hybrids of British origin. Clarke (1898: 17-21) described four *Phasianus* × *Tetrao* hybrids from Scotland. Numerous *Phasianus* × *Gallus* hybrids have been reported.

A recent hybrid of this type from Oceana County, Michigan was reported in the newspapers. J. M. Moore, Extension Poultryman at Michigan State College, East Lansing, Michigan, has supplied me the following information (letter dated November 30, 1950) concerning this bird: "Two years ago this spring [i.e., in 1949], a couple in Oceana County bought or were given a number of pheasant eggs from the State Game Farm, which they hatched out and brooded under a White Rock Hen. At 6 weeks old, the birds were released. All except one [a male] left for the wilds immediately. The one pheasant stayed with the mother all that Summer and Fall and during the winter time roosted in a tree outside the house. . . . A year ago this Spring [i.e., in 1950], this pheasant cockbird mated with this [foster mother] White Rock Hen and she stole her nest. The crossbred chicks hatched. Because the hen had stolen her nest quite a few of the eggs were spoiled during the hatching period and finally 5 chicks were hatched out. Unfortunately 4 of the 5 hybrid chicks drowned by getting into an uncovered water dish, leaving only 1 bird. This bird turned out to be a female and was kept in captivity with the mother White Rock Hen." In 1951, a male Ring-necked Pheasant was introduced into the mating pen with both the White Rock Hen and the hybrid female pheasant. Mr. Moore recently wrote that: ". . . the hybrid cross seemed to be so afraid of this foreign bird in the pen that we think she just ran herself to death through fear."

Anthony described a *Phasianus* × *Dendragapus* hybrid from Portland, Oregon (1899: 180) and listed three other specimens of the same sort. He stated that "the report that such crosses are not uncommon would seem to have some foundation."

Bump (1947: 268) reported a *Phasianus* × *Bonasa* hybrid taken about 1930 in western New York. The specimen has been lost. Interbreeding of the Ruffed Grouse and a domestic chicken has been reported by J. E. H. (1886: 4) from West Virginia, but the report has never been confirmed.

Pleske (1887) described and figured both a male and female *Lyrurus* × *Tetrastes* hybrid. He referred to two earlier papers on this hybrid, one by Dresser, the other by Bogdanow.

Hybrids involving the genus *Lagopus* have been reported from Europe far more often than from America, possibly because interest in this genus as a game bird is greater in the Old World than in the New. *Lagopus* × *Lyrurus* hybrids have been reported several times. In his excellent discussion of this cross, Collett (1886) listed 22 specimens from Norway and 12 from Sweden. Millais (1909: 52) considered the *Lagopus scoticus* × *Lyrurus tetrix* hybrid "extremely rare." Collett (1886) mentioned a *Lagopus* × *Tetrastes* hybrid from Sweden.

Taverner (1932: 89) reported a *Lagopus* × *Canachites* hybrid. This is the only instance of intergeneric hybridization involving the Spruce Grouse so far as I know.

Millais (1899: 36), at a meeting of the British Ornithological Club on February 15, 1899, exhibited a hybrid involving *Lagopus scoticus* and a female bantam fowl (*Gallus*).

Strangely enough, of reported intergeneric hybrids among American quail only one, so far as I know, has involved the widespread genus *Colinus*. Aiken (1930: 80) reported on three *Colinus* × *Lophortyx* specimens taken near Salt Lake City, but these have been lost.

Bailey (1928: 210) reported a *Callipepla* × *Lophortyx* hybrid taken near Pinos Altos, New Mexico, in 1916. The specimen was sent to Louis Agassiz Fuertes, who made a very beautiful feather-by-feather painting of it. When Fuertes acknowledged receipt of the specimen he mentioned that he had "once painted a very interesting wild hybrid (male) *Lophortyx* and *Oreortyx* for Mr. Loomis."

All that remains of this particular *Lophortyx* × *Oreortyx* specimen is a *print* of a photograph of the Fuertes drawing. The skin itself, the Fuertes drawing, and apparently the negative of the photograph of the drawing all were destroyed in the San Francisco fire. Through the courtesy of Kenneth C. Parkes I have obtained a photograph of the print referred to. This has been reproduced here.

Peck (1911: 149) described in detail an *Oreortyx* × *Lophortyx* hybrid taken in 1911 in Harney

County, Oregon. The specimen is now in the collection of the University of California Museum of Vertebrate Zoology.

Other intergeneric galliform hybrids have been reported from various parts of the world, but those discussed above seem to be the most important in so far as game species of the northern hemisphere are concerned. Numerous crosses involving *Gallus*, *Numida*, *Pavo*, and certain of the ornamental pheasants have been reported, but these hybrids have appeared



FIG. 1. *Lophortyx* × *Oreortyx* male hybrid. Photograph of a painting by Louis Agassiz Fuertes.

principally under artificial conditions. The validity of certain reports must remain doubtful. Finsch (1892) reported a *Gallus* × *Menura* hybrid. The crossing of a galliform bird with any such passeriform bird as the Lyre-bird would seem to be quite impossible.

HABITAT AND BREEDING BEHAVIOUR IN RELATION TO HYBRIDIZATION

Tetrao × *Lyrurus*. The habitats of these grouse apparently overlap to some extent at some seasons. Witherby *et al.* (1941: 209–210) described the habitat of *Tetrao* as follows: "Frequents mature coniferous woodland (larch, spruce, scots pine) of medium density with a fair amount of undergrowth. . . . In autumn, spring and winter numbers make short local movements to low-lying woods of oak, birch and larch, but most, especially old males, return to higher ground in late autumn and spring; in autumn sometimes found amongst heather at some distance from woods and also visits stubble or more rarely turnip fields (Millais)." These authors describe the habitat of *Lyrurus* thus: "Haunts fringes of moorland rather than open moors, resorting to rough, heather grown or bushy land, sparsely wooded places and bushy borders of woods or plantations, rushy pastures and marshy ground; also lowland heaths, peat-moors, etc. with heather, gorse and (or) other scrub and frequently, though not always, with scattered birches or other trees."

Tetrao and *Lyrurus* are somewhat similar in breeding behaviour. Writing of *Tetrao*, Witherby *et al.* (1941: 211–212) say: "'Song' of male is uttered in characteristic attitude with the neck stretched up, tail fanned and vertical or nearly so and wings drooped during most of the time. . . . During displays on ground 'songs' are interspersed with parading to and fro in different directions and leaps of about 3 ft. into air, accompanied by noisy flapping of wings." Of *Lyrurus* they say (1941: 217–218): "Has special display-grounds or 'leks', to which both sexes resort and at which coition takes place. . . . In all of the several display attitudes tail is fully spread, . . . , wings are partly drooped and red wattles above eye distended. In crowing . . . , to some extent a social performance, head and neck are held upright and bird either remains stationary, slightly raises head and lowers wings, or jumps into air."

Pedioecetes × *Tympanuchus*. In discussing the habitat requirements of *Pedioecetes*, Grange (1948: 237–239) says: "The final or desired arrangement [of plants] is prevalingly open. In gross appearance it presents long views across grass, sedge, weed and herbaceous covering dotted with innumerable clumps and groves of shrubs, bushes, saplings, and some larger trees. . . . Prairie chickens often use the pattern, overlapping with sharptails, but this is not typical."

In Michigan, according to my observation, the Prairie Chicken and Sharp-tailed Grouse now associate only in areas throughout which scattered colonies of the Prairie Chicken remain. Range-overlap has been increased through the introduction of the Sharp-tailed Grouse into the eastern part of the Upper Peninsula and the northern part of the Lower Peninsula. These introductions were begun about 1937 and hybrids have been reported from the two areas for the past several years.

The breeding behavior of these two genera is so well known that a comparison here is hardly necessary. Both are polygamous and both assemble on displaying or sparring-grounds. The high frequency of interbreeding between these genera must result, in part at least, from range-overlap plus similarity of breeding behavior. It is interesting to note that on the basis of osteology alone, Shufeldt (1881: 348) could "perceive no good reason" why *Tympanuchus* and *Pedioecetes* should not be merged.

This brief summary of galliform hybrids is but a beginning toward a much needed study of the basic factors involved in intergeneric relationships. The importance of habitat and behavior overlap apparently has not been considered by those reporting on the occurrence of wild hybrids. Data as to the viability and fertility of hybrids are almost non-existent. Such data are important economically since they may have profound bearing upon management techniques. Further study of hybridization may effect also certain of our taxonomic concepts.

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CUSINO WILDLIFE EXPERIMENT STATION, SHINGLETON, MICHIGAN

A SERIOUS PROBLEM IN CONSERVATION

Dinosaur National Monument had its origin some eons ago when giant, grotesque reptiles died for reasons now resolved only by speculation. These monsters were buried in rock and soil of a land that was later to become part of the state of Utah. So scientifically and recreationally important were the remains of these prehistoric animals, that in 1915, 80 acres surrounding the main fossil site were set aside as a national monument.

The graveyard of the dinosaurs in the valley of the Green River is auspiciously located. The swift flowing Yampa River joins the Green about 20 miles upstream. Together these two streams with whirlpools and eddies have cut a series of exquisitely beautiful canyons from the equally handsome mountain landscape.

The awe-inspiring grandeur of these two river valleys in the region of the dinosaur fossils caused 209,000 acres of the combined watersheds in Utah and Colorado to be added to the monument in 1938. As a national monument, it is not as well known as others; it is none the less as elegant scenically and as important scientifically as they.

Despite the fact that the 1935 amendment to the Federal Power Act prohibits such areas from becoming part of a power project, the Bureau of Reclamation in 1946 proposed two dam sites *within* the area. The National Park Service came to the defense of Dinosaur National Monument with the same fervor it would have shown had the proposal been that Yellowstone National Park be leveled in order to build a mammoth roller skating rink. The problem in brief is this: one government agency is recommending that a national park, which is under the jurisdiction of another government agency, be made into a reservoir instead of serving in its present capacity as a recreational and scientific area.

The main stand of the Bureau of Reclamation is that, without these dams, there will be less annual revenue and higher unit power costs for the people of the Colorado watershed and Bonneville basin. The Park Service contends that it is not unmindful of the needs of even this extremely small fraction of our national population. The benefits of the proposed impoundments would be adequately and satisfactorily derived from dams and reservoirs *outside* the monument.

The life expectancy of a dam and reservoir of this kind and in this place is about 80 to 120 years. The natural beauty and scientific wealth of this area was about a hundred million years in the making. Flooding the Dinosaur National Monument would ruin it for all future generations.

It must be realized that once a proposal of the Bureau of Reclamation is accepted by the Congress, moneys are made available to carry out the dictates of that proposal. In this case, the dams would cost about \$207,000,000. The immediate political and economic potency of such a plan might be overwhelming to an agency like the Park Service which must carry its